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Tech Solutions – Powered by Naval Research

ABSTRACT

The Office of Naval Research is currently developing a web-based tool that will allow Sailors and Marines to seek Science and Technology (S&T) solutions to pressing Naval needs. The Naval Fleet/Force Technology Innovation Office currently provides this capability by placing Naval Research Science Advisors at various Naval and Marine Corps commands throughout the world and by facilitating access to the Department of the Navy (DoN) S&T community. However, the current process does not connect today's tech-savvy Sailors and Marines to the DoN S&T community as well as it could.

The development of this web site, and the subsequent process to develop the solutions, will allow for an easily accessible method for identifying problems, communicating the pertinent aspects of those problems to the DoN S&T community, identifying common problems across Fleet/Force commands, and developing and exploring potential solutions. The various aspects of the process include the validation of the needs with the Fleet/Force commanders, solicitation of potential solutions from the DoN S&T community, development and selection of a project to provide a solution, and demonstrating the solution with the requesting Fleet/Force command. Every effort will be made to coordinate with appropriate acquisition commands to ensure that successful solution demonstrations are transitioned to the entire Fleet/Force.

A pilot study is being conducted at several commands throughout the Fleet/Force to develop and refine this web site and the underlying processes. This paper will describe the challenges of this initiative, the web-enabled process, and the progress of the pilot.

INTRODUCTION

Two of the main objectives of the Office of Naval Research (ONR) are to (1) move Naval Science and Technology (S&T) programs closer to the Fleet/Force customer, and (2) bridge the gap between customer short-term needs and long-term commitments. The primary focus of ONR's Naval Fleet/Force Technology Innovation Office (NFFTIO) is achieving these two objectives. NFFTIO endeavors to get technologists to find rapid solutions to immediate Fleet/Force problems or issues that result in degradation in Quality-of-Service (QoS) and/or reduced Readiness to perform assigned missions.

This paper discusses the design and implementation of a new web site called "Tech Solutions" to support the above objectives. We will present the concept for this initiative, the motivation to initiate it, a description of the process, current status, and future plans.

CONCEPT

The concept for "Tech Solutions" is to align DoN S&T resources with problems that directly impact QoS and Readiness throughout the Fleet/Force. ONR has developed a process that will quickly provide technical solutions to problems identified by Sailors and Marines throughout the operational Navy and Marine Corps. By web-enabling this process ONR will

improve communication between the warfighters and S&T community, reduce the time and manpower necessary to process customer requests, and enable technology-based solutions to problems that have a detrimental affect on the ability of the Fleet/Force to train, operate, and fight.

ONR provides direct S&T support to component and operational commands by deploying Naval Research Science Advisors (NRSA's) to the Commanders-in-Chief (CINC's), Commander Marine Forces (COMMARFOR's), Numbered Fleets, Type Commanders (TYCOM's), and Marine Expeditionary Forces (MEF's) located throughout the world. NRSA's also are assigned to other Navy, Marine Corps, and Joint Commands like OPNAV, Strategic Studies Group, Joint Forces Command, etc., for a total of 24 positions. Among other duties, NRSA's facilitate the development of near-term technology-based solutions to immediate Fleet/Force problems or issues.

Although the current NRSA outreach and reach-back network has been well established and effective for many years, it is somewhat limited to commands where NRSA's are located. The implementation of Tech Solutions will greatly enhance the ability of ONR to identify problems and provide solutions in a timely and cost-effective manner throughout the Fleet/Force. Using a web-based approach, a S&T solution avenue is made available for all Fleet/Force commands to identify problems or issues and rapidly canvas the entire Naval Research Enterprise (NRE), or solution providers, for S&T solutions. Currently, NRE members include ONR, the Naval Research Laboratory (NRL), Systems Commands (SYSCOM's) and their associated Warfare Centers, Naval Medical Laboratories, and Naval S&T affiliated Universities.

The main objective of Tech Solutions is to quickly resolve Fleet/Force problems and issues that need a technological solution. By soliciting inputs from Sailors and Marines closer to the deck plates and field, we hope to gain a better understanding of their needs and identify root causes of the problems they experience. Tech Solutions offers individual Sailors and Marines the opportunity to submit requests that will potentially improve their personal ability to achieve the tasks they have been assigned.

The concept is fairly straightforward. Naval Research Science Advisors receive Tech Solutions requests directly from Fleet/Force Sailors and Marines, validate them, and forward them to ONR. ONR briefly reviews the requests and distributes them to potential solution providers, the NRE. NRE members submit proposals or identify existing efforts that could solve or will solve the requested deficiency. Then, an ONR board of technical and operational experts review, and ultimately select, proposals submitted by NRE commands. The board also can facilitate communication between the Fleet/Force customer and those NRE commands that have solutions already in progress. Once a determination is made by ONR to start a new project, funding is provided to the NRE command whose proposal was selected and the project is initiated.

One objective of the process is to keep the Fleet/Force submitter involved in the entire process from submission, review, and selection through project execution. This is necessary to ensure that the Fleet/Force stays in the loop and receives the solution they requested. Ideally, the new capability provided by the solution will be demonstrated in the command that submitted the initial request.

HISTORY

Tech Solutions evolved from an idea that RAdm. Jay Cohen articulated shortly after taking over as the Chief of Naval Research (CNR) in June 2000. RAdm. Cohen felt very strongly that today's Sailor or Marine would be comfortable with communicating

their ideas for improving their job and using a web site for that purpose. He also envisioned a coalition of solution providers made up of the Navy's existing research and development commands that would bid, via proposal, on solutions to Fleet/Force requests. This coalition is now referred to as the NRE. Initially he referred to this process as a reverse auction or reverse eBay-type process, but eventually settled on Tech Solutions. With his concurrence, personnel in the Naval Fleet/Force Technology Innovation Office (NFFTIO) initiated the process to define the requirements.

RAdm. Cohen's initial guidance included leveraging on-going initiatives by some of the Navy's Systems Commands regarding Fleet/Force hot lines and distance support web sites for two reasons. The first was to ensure that we were not duplicating any effort or service that another command was already providing and the second was to offer another dimension or resource from Navy S&T to supplement existing efforts.

After an initial search and additional inquiries, we found that the most robust web-oriented, on-going effort in this arena was an initiative started by the Naval Sea Systems Command (NAVSEA). NAVSEA's Distance Support Anchor Desk, and specifically, their web portal, had been available to Fleet/Force service personnel for over a year. Their web portal was fairly robust in what it offered in the way of services to Fleet/Force personnel and, after some initial discussions, both sides agreed that it made good sense to offer an S&T component to their portal. The Anchor Desk support personnel from NAVSEA Logistics Center in Mechanicsburg, PA, offered to provide web development assistance to implement the Tech Solutions pilot program design, thereby ensuring a proper interface between our two initiatives.

The Tech Solutions pilot project was initiated on January 8, 2001, and ran through April 30, 2001. Although all NRE commands were included in the pilot project as possible solution provider candidates, participants from the Fleet/Force were limited to six. Fleet/Force commands included Commander, Naval Air Forces Atlantic Fleet; Commander, Naval Surface Forces Atlantic Fleet; Commander, Submarine Forces Atlantic; Commander, Sixth Fleet; Commander, Marine Corps Forces Atlantic; and Commanding General, Second Marine Expeditionary Force. After the pilot is complete, processing of additional requests received after 30 April will be suspended for approximately two months. During the two-month hiatus, the process will be reviewed and analyzed. Then, enhancements based on lessons learned, feedback, etc. will be implemented. Tech Solutions will then be formally introduced to the entire Fleet/Force in July 2001.

PROCESS DESCRIPTION

The goal of Tech Solutions is to provide quick turnaround of submission requests to solution identification and, if necessary, project award and execution.

The whole process must be enabled within a secure, virtual environment that allows for clarification of issues and problems at any point in the process. With Naval Research Science Advisors assigned to Fleet/Force commands around the world, operational constraints can impact real time collaboration. Also, some discussions may be considered proprietary as proposal development is proceeding, particularly if an NRE member has involved a contractor in the proposal development process and that contractor requires restricted access to portions of the information flow. Finally, for this process to be effective, the original Fleet/Force submitter must be able to follow the progress of his or her submission. Timely and substantive feedback will be measures of effectiveness in the eyes of the Fleet/Force. Figure 1 represents the general process flow diagram for Tech Solutions.

Process Initiation

The process starts with a Tech Solutions request being submitted by a uniformed Sailor or Marine, enlisted or officer, via the home page at www.techsolutions.navy.mil. The submitter is asked to answer five general questions. They are: (1) What is your observation or problem, (2) What would a solution need to be able to do, (3) What are any ideas you have on how to solve the problem, (4) Is there any additional history you would like to add, and (5) Other comments. The request is then automatically forwarded to the appropriate NRSA in the submitter's chain-of-command for an initial evaluation.

Fleet/Force Validation

After receipt, the assigned NRSA and selected staff members determine validity, priority, S&T merit, and ensure the request is clearly defined. General guidance is provided to Fleet/Force NRSA's and staff members to help them determine S&T merit. Exploratory Development and Advanced Development as defined by Department of Defense Instruction 5000.2, "Operation of the Defense Acquisition System," contains this guidance. The definitions are quoted below for your convenience.

> "Exploratory Development includes effort directed toward the solution of specific naval problems, short of major development projects. The role of the Exploratory Development program is to ensure that, as technological advances appear, they are investigated for possible development/exploration to determine applicability to future Naval programs. This type of effort may vary from fairly fundamental applied research to sophisticated bread-board hardware."

> "Advanced Development includes all projects that are characterized by the development of hardware for experimental test. The prime result of this type of effort is proof of design. At the core of the Advanced Development program is the imperative to develop and make available to the Fleet new and advanced technologies that will ensure the long-term superiority of U.S. forces."

Ultimately the NRSA and other command staff members will choose one of four options when reviewing Tech Solutions requests: (1) Reject a request if it is determined to not be a valid problem or issue; (2) Accept the request as a valid problem or issue but does not lend itself to an S&T solution; (3) Accept the request as valid and having a possible S&T solution; or (4) Return the request to the submitter for further clarification.

NRE Response

Assuming the request is validated and meets general S&T solution criteria, it is forwarded to ONR for a brief review, then vetted to the NRE. All NRE member organizations evaluate the submitted request, comment on it as desired, and if appropriate submit a point paper. Point papers, or mini-proposals, provide NRE commands an opportunity to submit a short, concise description of possible solutions. These possibilities could include (1) something off-the-shelf from previous efforts that could solve a percentage (100, 80, etc.) of the identified problem or idea, (2) a related effort currently in development that solves a percentage of the problem or idea, (3) a center of expertise within a NRE command that can propose a new effort, or (4) information on another organization or command outside Naval S&T that could have a potential solution. Point papers and other comments and recommendations should be submitted via the web within five working days of being solicited.

Consideration will be given to each point paper submitted before soliciting formal proposals from select NRE commands. There are no limits placed on the number of point papers selected and organizations and commands can submit more than one point paper per request. Tech Solutions review board members, consisting of ONR and Fleet/Force representatives, will select promising point papers and a request for a formal proposal will be solicited for each point paper selected. For those point papers selected, ten working days from the date of notification will be allotted to NRE commands to submit formal proposals.

Not all NRE members will possess capabilities to assist in all areas that submitted requests cover and, if that is the case, no action is required of the NRE member command. Also, it is important for NRE solution providers to keep in mind some of the solution selection criteria. Tech Solutions projects are not formal acquisition programs but rather S&T efforts that will lead to demonstration or experimentation of a new or improved capability with operational forces. Projects that begin via this process should require less than 12 months to execute and deliver. Costs of efforts should be modest and commensurate with the length of the project. Large numbers of prototypes should not be expected – only small numbers, in the range of single digits. Every effort possible will be made to find and coordinate with transition sponsors in the event a demonstration or experiment is successful. The goal is always to demonstrate a capability for the users.

Project Selection and Initiation

As previously stated there are two review and selection processes: one for point papers received and another for formal proposals received. The Tech Solutions review and selection board is composed of members from ONR and representatives from the Fleet/Force which include the NRSA's. The board's charter is to first select those submitted point papers that have the best potential of solving and demonstrating the desired capability requested by the Fleet/Force submitter. Once point papers are selected, formal proposals are solicited from commands whose point papers were selected. After receipt of all formal proposals, the review and selection board determines the best solution for the identified problem and funds it.

It must be stressed that during the point paper review process some NRE commands may have submitted information on Programs of Record or efforts already in progress that can solve all or a portion of the submitted problem or idea. In these cases, it may be deemed more appropriate to facilitate the communication between solution provider and the Fleet/Force on the specifics of the work in progress. If the solution in progress will solve the submitted problem, the request will be placed in a monitor status or closed out completely.

Other options also exist for those projects that fall outside of the near-term schedule and low-level funding criteria. Submitted requests that are more difficult or complex and require efforts beyond the scope of Tech Solutions will be considered for alternative solutions. Alternative solutions can include efforts in the Future Naval Capabilities (FNC) process, the Fleet Innovation Project (FIP) process, or the Small Business Innovation Research (SBIR) process.

Once the best practical solution is funded, project execution begins immediately. Again, these projects are meant to be small, near-term efforts that can be conducted within the existing capability of the specific NRE command without a major impact on other existing work. There is no requirement that an NRE command conduct all of the work in-house, but the NRE member is responsible for assembling the team, which may include other Government organizations or contractors, who will perform the work. Depending upon the

solution selected, it is possible that the effort could be shared among the NRE proponents. NRE members are responsible for ensuring that all contractual requirements are satisfied, but ONR will fund and manage the project.

Feedback

Feedback is a two-way street and critical to the longevity of this effort. A considerable effort is required to keep both the Fleet/Force submitters and NRE solution providers informed of progress being made throughout the process.

Fleet/Force Sailors and Marines are assigned tracking numbers once a request is submitted and it is envisioned that this number can be used by them to check the status of their request at anytime, by going to the web site and entering their number. The status page will provide process tracking after initial submission as well as project milestones if a project is initiated. The goal is to have the initiating Fleet/Force unit participate in the demonstration or evaluation of the solution.

NRE members will have a desire to know the status of submitted point papers and formal proposals. NRE members are currently able to view the listing of their competition with regard to those commands that have submitted point papers and proposals. The actual content of these documents is not available to competing NRE members. Available to all NRE members are metrics that track the total number of requests vetted to the NRE, the number of NRE member point papers and proposal responses, the number of proposals selected, and the status of ongoing projects.

Project reporting requirements will also be available. The minimum monthly reporting requirements will consist of a single quad-chart. The quad-chart will consist of two static panes that contain (1) a project description and (2) a picture or artist conception of deliverables. The other two panes will be dynamic and contain (1) a funding chart or table depicting projected and actual expenditures and (2) accomplishments for (a) the current month and (b) projected for the following month. Mini-reviews should be anticipated midway through the project that will consist of a viewgraph brief given to members of the project selection board. Final report minimum requirements will consist of (a) written report, (b) viewgraph brief, (c) five-minute VHS video of deliverable(s) undergoing testing/demonstration. The reporting requirements are modest by design and commensurate with the level of effort. The primary project focus is centered on results based on the proposed POA&M. Robust reporting requirements are not required nor desired.

STATUS

Pilot

We are currently experimenting with a web-based site that accepts Fleet/Force inputs and has simple data management features. This is not intended as the final venue, but has been stood up as a 120-day pilot to help refine the process we are proposing for ultimate implementation in a complete eBusiness solution. Our experience to date has given us added insight to prepare for full implementation of our concept. Currently, it is a brute-force solution and is far from optimal. Data management, process tracking and reporting, simple site navigation, and multiple levels of user security are all areas that are being addressed to formulate a robust eBusiness solution.

As this paper is being written, we have received 17 valid submissions. Two were combined. One was deemed to not be S&T and was forwarded to the Distance Support Anchor Desk. The remaining submissions are in various stages of the process. Figures 2 and 3 are sample Tech Solutions metrics.

Lessons Learned

To be successful, the process needs to be easily accessible, understood, and used by all parties involved from Sailors and Marines to the NRE technologist who will ultimately identify a solution. The submission portion of the process is fairly straightforward regarding implementation and user friendliness. A bigger challenge is the process end of the web site that will be used by all NRE member scientists and engineers, ONR, and Fleet/Force staff decision-makers. The web process will need to be as intuitive as possible to reduce confusion and training requirements. As envisioned, the interaction between the Sailor and Marine and the NRSA takes place in the virtual computer environment. Using chat room or threaded discussion techniques, we can encourage a dialog between the submitter and the NRSA to gather more specific information and, thereby, improve our understanding prior to initiating attempts to produce a solution.

One area for improvement is advertising. The word is slowly spreading, and with continued success other Sailors and Marines will be encouraged to use Tech Solutions as a possible means to find solutions to their problems or ideas. A large number of NRE members are fully supportive and eager to participate in Tech Solutions as well, but additional work is necessary to further encourage those on the sidelines to get involved in providing solutions. Greater success will lead to greater participation from all sides.

Cultural change must be instituted for this to fully succeed. Effecting cultural change takes time and dedicated effort. We need to quickly deliver solutions to the submitted problems so that the Fleet/Force begins to spread the word about the existence of the capability and the effectiveness of the process. To do this, we plan to put the assigned project managers at the NRE in direct contact with the Fleet/Force personnel who desire the new capability. We believe this will make a strong, lasting impression on the NRE S&T personnel that inspires them to help today's Sailor and Marine, not just tomorrow's. Additionally, ONR management must be forthcoming with adequate funding to allow the NRE proposals to proceed as planned to build trust at the NRE organizations.

FUTURE PLANS

The pilot implementation, using web-site technology, does not use all of the tools that are available for executing this type of process. eBusiness methods are available to put the hardware/software to work, rather than the people behind the process. While many aspects of this process are unique to ONR and the Navy/Marine Corps in general, this project does not require the development of new eBusiness software beyond those already available in the commercial sector. The desired eBusiness solution impacts many existing business processes used by the Fleet/Force, ONR, and the NRE. First and foremost, it involves the Fleet/Force in the dynamics of the decision-making process for S&T projects. It will aid in speeding solutions to the Fleet/Force as well as facilitating the sharing of these solutions throughout the Fleet/Force. By incorporating best practices, it also will greatly reduce the manpower required to initiate, develop, review, approve and track a wide range of technology solutions.

CONCLUSION

The development of an eBusiness-based Tech Solutions process will foster a cultural change in how the Fleet/Force and the DoN S&T communities interact. When fully implemented, the Tech Solutions process will quickly deliver products to the Fleet/Force that improve the Quality of Service and/or Readiness of operating personnel. Every effort will be made to transition these successes to formal acquisition programs for the long-term benefit of the entire Fleet/Force. Finally,

this process will involve the NRE in the day-to-day activities and problems experienced by the Sailor or Marine as he attempts to perform his assigned duties and improve their awareness of their impact on the Mission of the Navy/Marine Corps. Figure 4 shows the Tech Solutions web page and web address.

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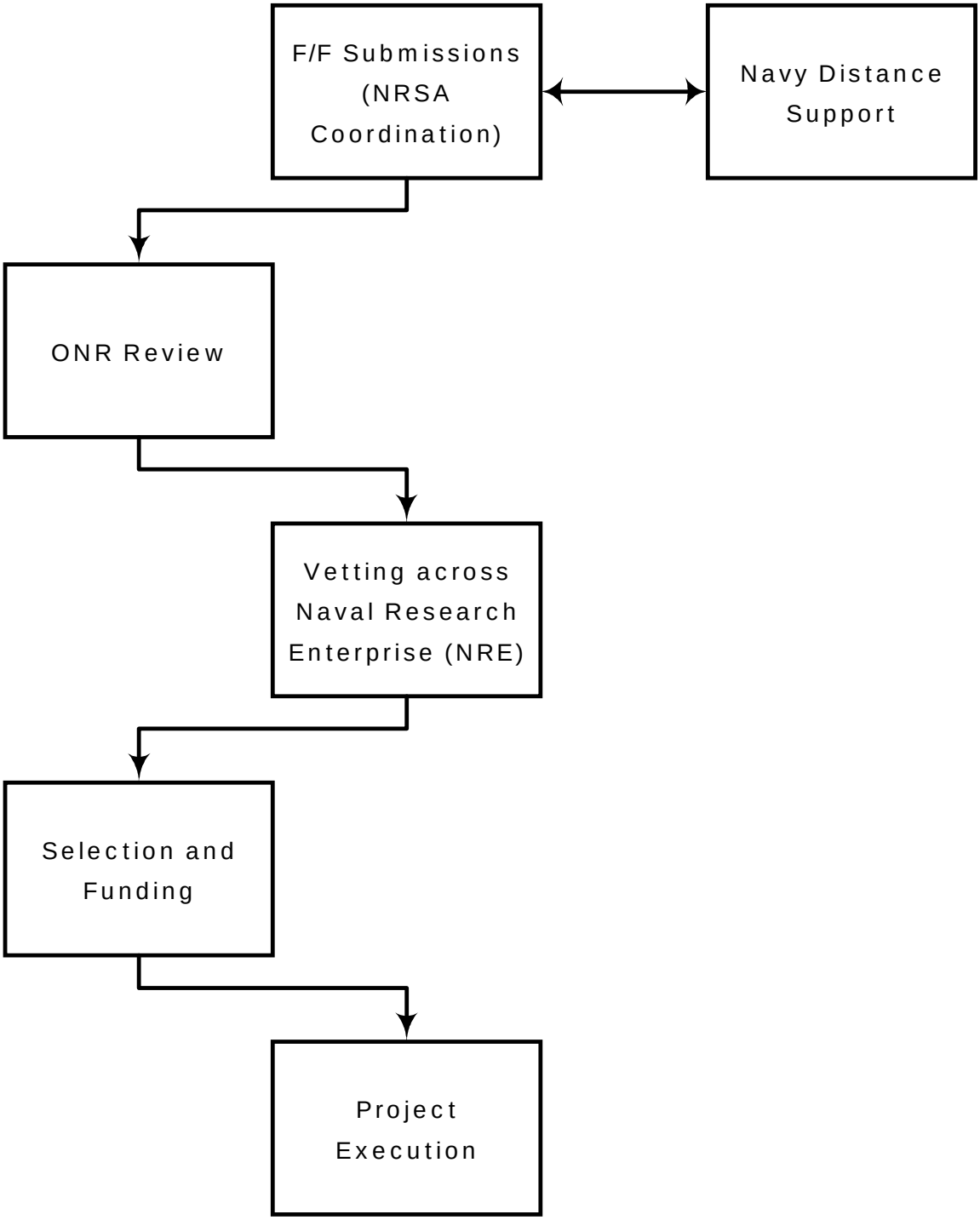

Figure 1. Tech Solutions Process Flow Diagram.

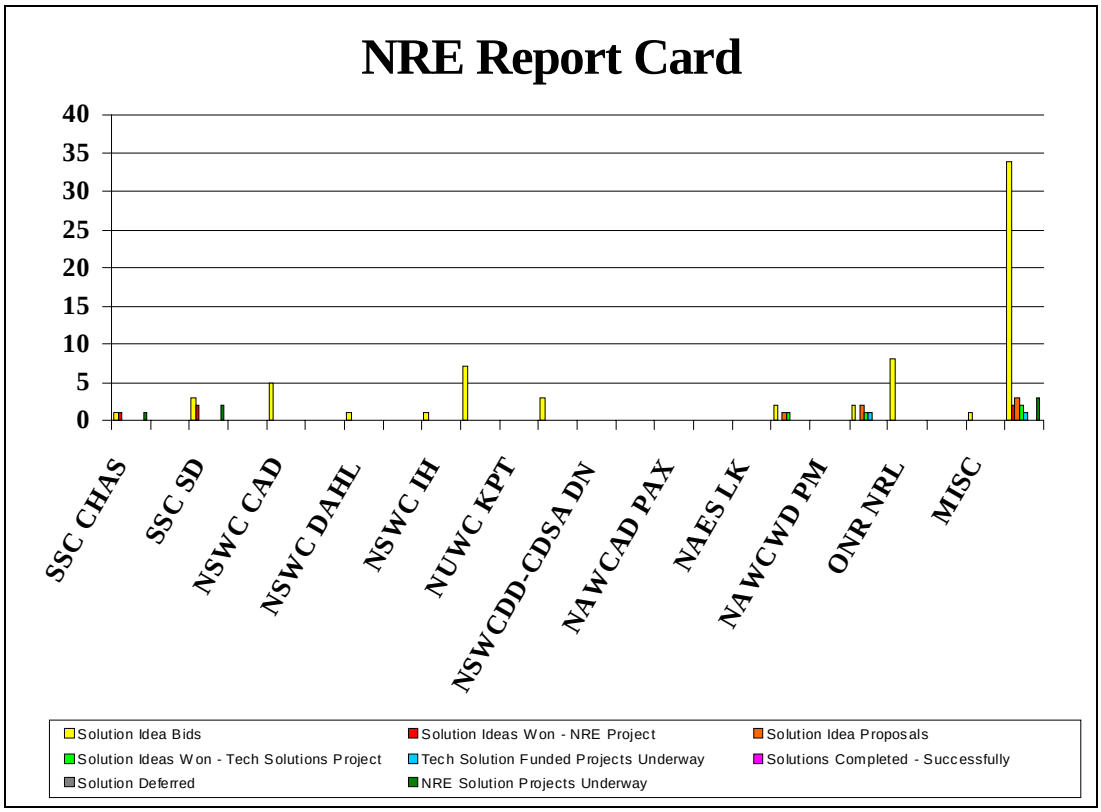

Figure 2. Sample Tech Solutions Metrics – Solutions/Point Papers.

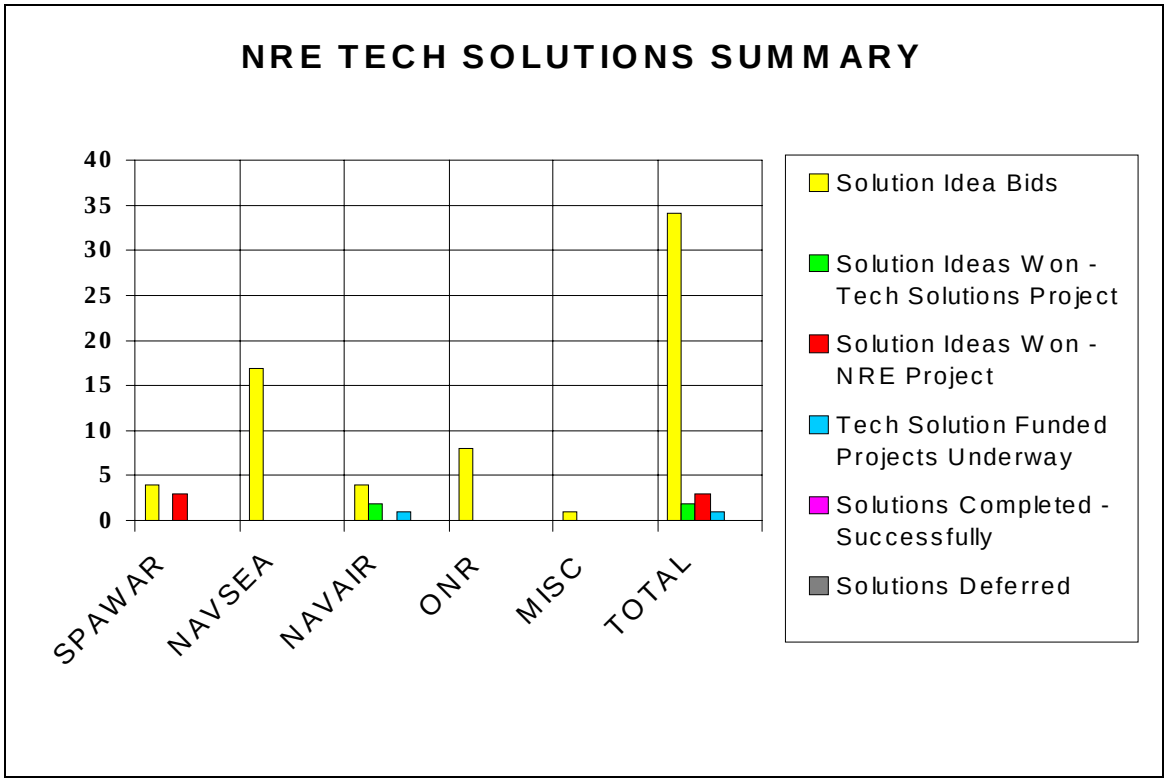

Figure 3. Sample Tech Solutions Metrics – Commands Submitting Requests.

Figure 4. Tech Solutions Homepage.